The Effect of GPS and Moving Map Displays On Navigational Awareness While Flying Under VFR

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Manufacturers boastful about “situation awareness” advantages of glass cockpit technology:

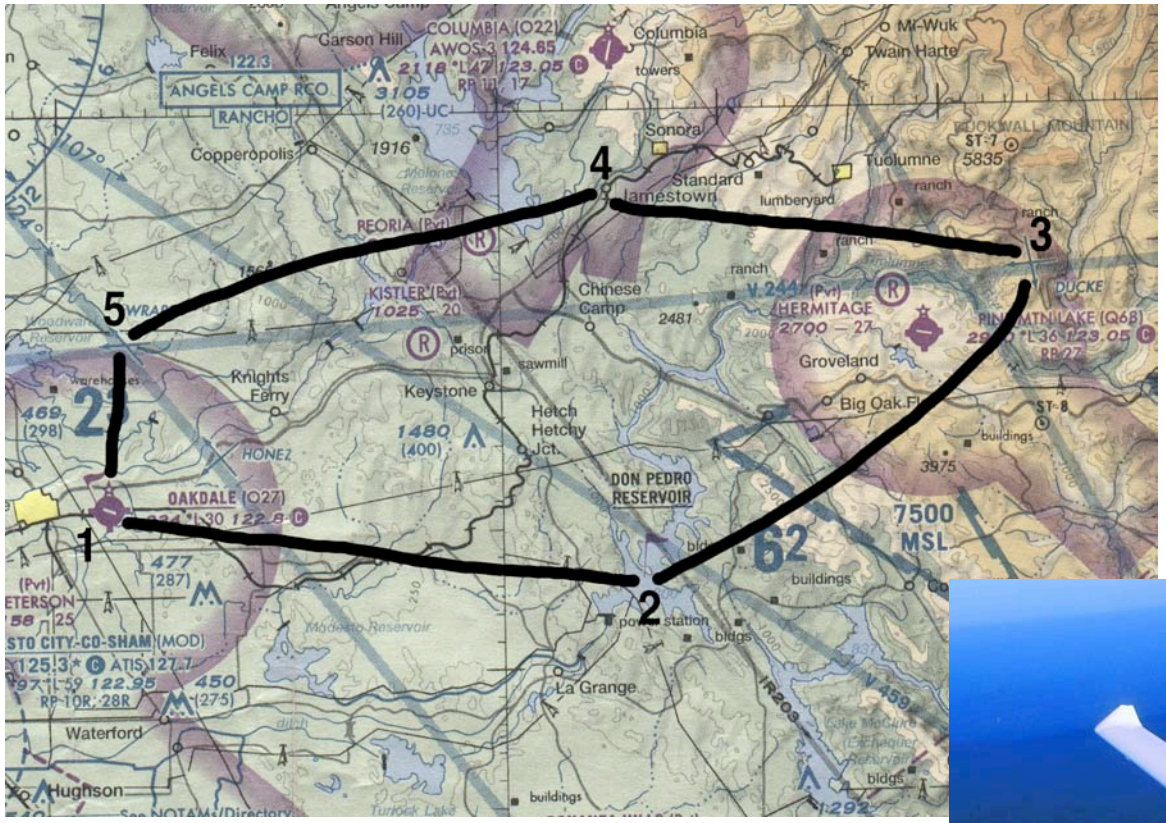
- “Fly intelligently at the pinnacle of situational awareness.”
- “Be aware. Be very aware.”
- “The G1000 system increases situational awareness by …”

Two Research Questions

1. Do pilots believe that their awareness is greater in a glass cockpit than it is in a conventional cockpit?

2. Does pilot performance match their beliefs?

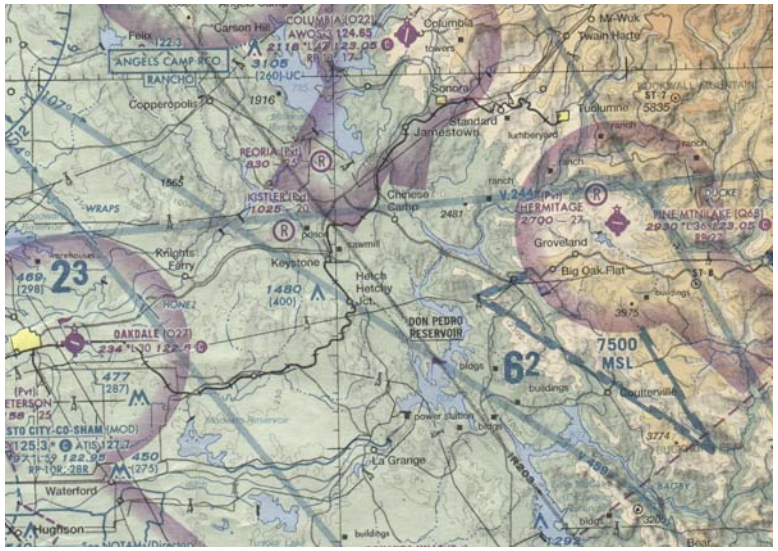
Experiment



Two groups of pilots flew a circuit of checkpoints over unfamiliar terrain.

Experiment

One group used PILOTAGE

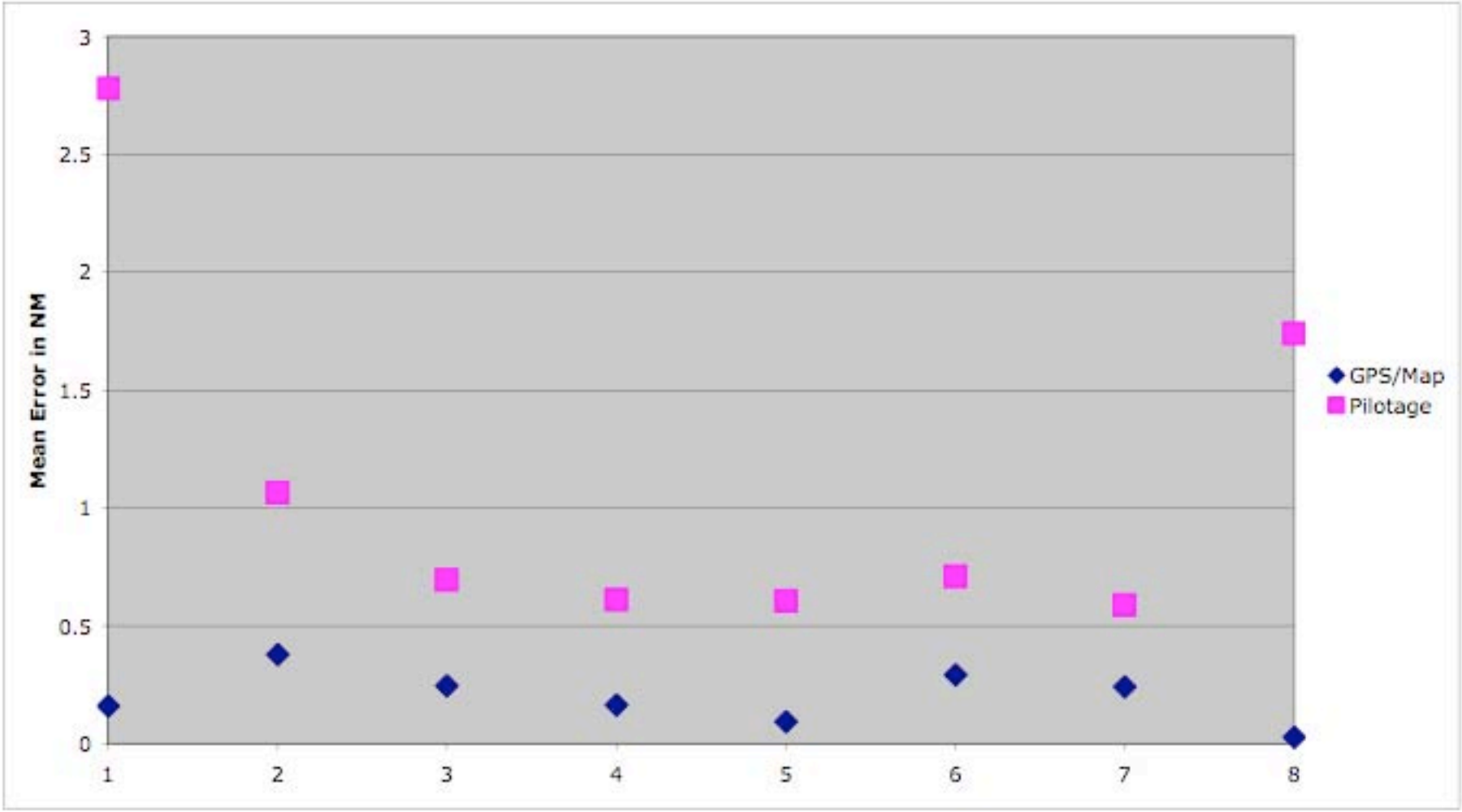


The other group used a GPS with a MOVING MAP display

Pilots' Estimations of Navigational Awareness

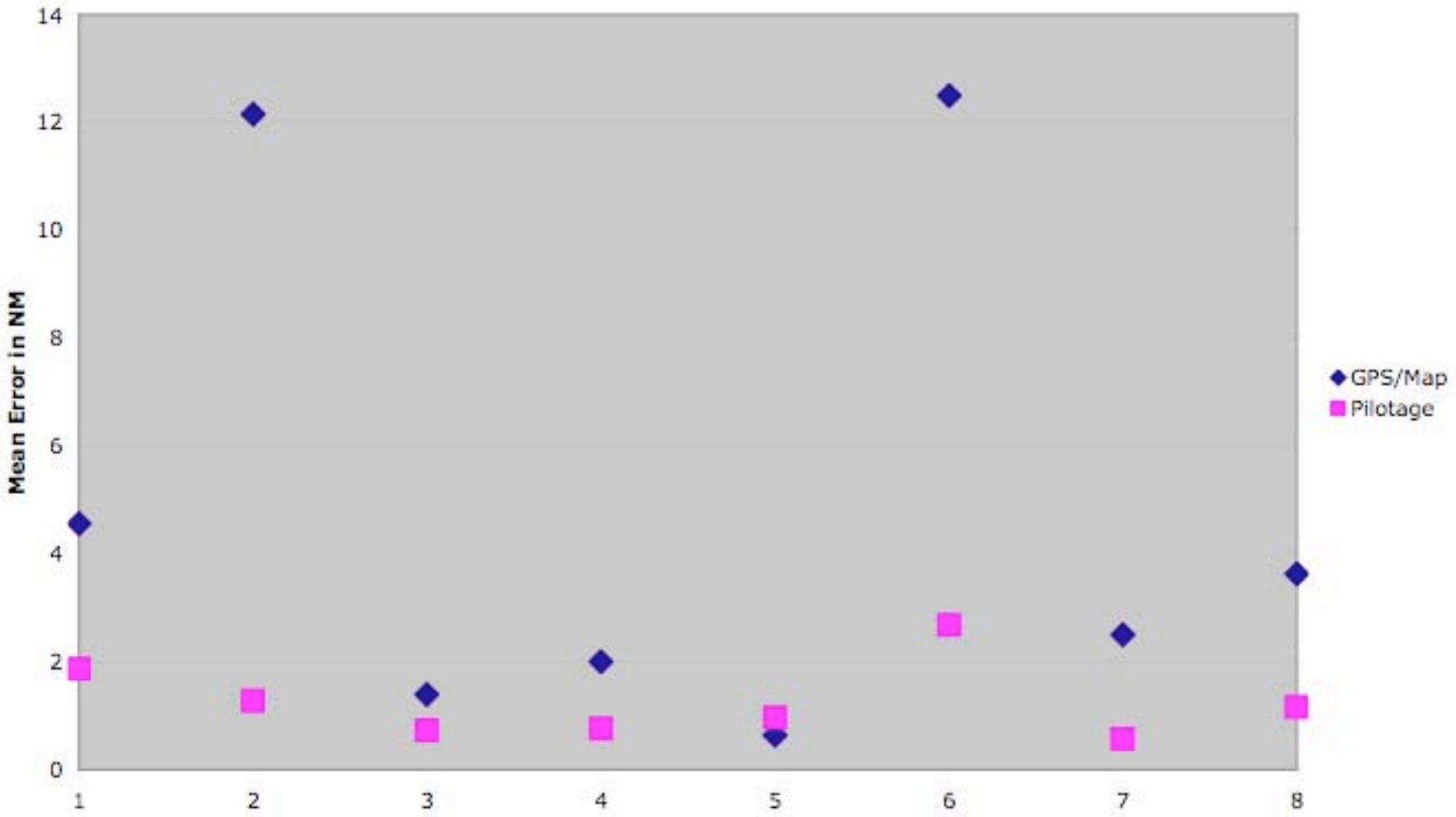
	Using Pilotage	Using GPS/Moving Map
Pilotage Group	7.625	9
GPS/Moving Map Group	6.625	9
Both Groups Combined	7.125	9

Navigational Accuracy (with resources)



Pilots were then asked to fly the course again, this time with no chart or GPS.

Navigational Accuracy (without resources)



Conclusions

- Pilots believe that GPS and map displays improve their “awareness.”
- Results question this belief: The awareness doesn’t seem to reside in the head of the pilot.
- Equipment outages may present a dire situation.
- Difficult problem to remedy: How to stay in the loop?
- Next Studies:
    1. All pilots use GPS and Moving Map … but … are asked to perform an additional task that requires active processing.
        a. The curious passenger
        b. Impending emergency
    2. IFR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